Compliance Report for 2012: Biological Opinion for Stream-Crossing Projects Administered/Funded by the South Dakota Department of Transportation and the Federal Highway Administration

By:

Office of Project Development
South Dakota Department of Transportation
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Submitted to:

United States Fish and Wildlife Service
Mountain-Prairie Region 6
South Dakota Ecological Services Office
Pierre, SD

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Introduction:

In August of 2008 a new Biological Opinion (Opinion) was accepted by the United States Fish and Wildlife Service (FWS) for projects implemented by the South Dakota Department of Transportation (SDDOT) and the Federal Highway Administration (FHWA). In this newest Opinion, policy changes allowed construction projects to proceed during the previous "blackout period" (May to August). However, for implementation of this "no blackout" construction schedule some new and additional Reasonable and Prudent Measures (RPM's) were set in place:

1.) Habitat fragmentation/ Fish Passage

2.) Minimize Fish Mortality

3.) Sediment and Erosion Controls

4.) Monitoring

5.) Training

6.) Reporting

7.) Including Current or New Scientific Information

In this document data will be included on 1) each RPM which can be found in the reporting forms (Appendix 1) and in the text to follow, 2) the efforts to implement a monitoring program, 3) Turbidity monitoring at construction sites, and 4) a brief section on recent scientific publications.

In addition to the new RPM's, three Conservation Recommendations (CR) were implemented in the 2008 Biological Opinion:

1) Develop methodology to identify, track, and prioritize, for replacement, any existing structures that are found to fragment Topeka shiner habitat.

2) Develop strategies that can enhance riparian habitat along known and potential Topeka shiner streams.

3) Develop strategies to improve in-stream habitat for Topeka shiners.

There are currently discussions with three other state DOT's and two other Fish and Wildlife offices on applying tracking measures to culverts. Missouri recently implemented a tracking and mitigation program. Information on this program is being collected to see if similar procedures might be utilized by South Dakota for tracking fish passage concerns. Similarly, biologists at Kansas State University and South Dakota State University are also being contacted in regards to prioritizing culverts, particularly in Topeka shiner habitat.

During Type, Size, & Location (TS&L) and preconstruction meetings riparian habitat protection measures are usually discussed with contractors and engineers. Typically this involves recommending bioengineering around the structure, maintaining a section of natural stream bottom through the structure (if a bridge is going in), and ensuring all BMP's will be used and maintained accurately. Development of construction practices which will protect or improve habitat available to stream fish (including the Topeka shiner) is under consideration. Other countries (New Zealand, Australia, and some African Countries) are trying to minimize in stream work by leaving the channel

intact with work zones outside the banks two to four feet. However, more research is needed to get a complete picture of stream habitat maintenance.

Summary of Construction Activities:

In this Annual Compliance Report, data related to construction at 24 bridges, culverts, and pipes built in the State of South Dakota by the Department of Transportation will be documented (Tables 1 and 2). This data will relate to Reasonable and Prudent Measures (RPMs) and Conservation Measures (CMs) indicated in the Biological Opinion: Stream-Crossing projects funded/administered by the South Dakota Department of Transportation and the Federal Highway Administration (Opinion). All structures reported on in this document were completed between January 1st 2012 and December 31st 2012. It should be noted that with limited resources and the complications of locating projects, it is possible that a minimal number of "Affect, Not Likely to Adversely Affect" projects may be missing from this document. It is certain that all "Affect, Likely to Adversely Affect" projects have been located and totaled for this report. At present, a way to collect and file documents related to the Biological Assessments (B.A.s) is being devised.

For 21 construction projects within the Topeka shiner range during 2012, 12.18 acres of riparian area was temporarily affected by vehicles or construction activities. Nine of the 21 projects listed in the SDDOT Project Reporting Forms affected between 0.5 and 1.0 acres in 2012. Observations of projects under construction indicated that the reported 0.5 to 1.0 acre may be greater than the area that is actually affected by activities.

Summary of Habitat Impacts:

Projects in 2012 which were listed to "Affect, Likely to Adversely Affect" the Topeka shiner totaled 21; and 3 projects were listed "Affect, Not Likely to Adversely Affect" the Topeka shiner (Table 1). The RPM's of the Opinion are applied on projects which will "Adversely Affect." This is due to the fact that anticipated "take" of Topeka shiner is expected to be zero at sites "Not Likely to Adversely Affect."

The 21 stream crossings permanently impacted 3141 feet of stream channel. This length of channel impact is primarily due to placement of structure, riprap scour protection in the stream and along the banks of the stream. Riprap made up approximately 972.50 feet of stream channel impact. Placement of riprap at the inlet and outlet of box culverts were the primary cause of this impact with some affect being the riprap placed for abutment protection at bridges. The remaining 2168.50 feet of impacts to the channel is due to replacing an old structure with a new longer structure, or extending the ends of an existing structure (Table 2).

Flowlines and Bankfull Width in Relation to Fish Passage

In general, culvert projects affect more stream channel than bridge projects. Lengths of stream impacts reported in this document do not make any suggestion of the severity of impacts at individual project sites. Although culverts impacted more stream length than bridges, RPMs implemented at culvert projects minimize impacts to stream channel. With one exception, all new culverts were lowered at least six inches based on elevations of the stream channel per the 2008 Opinion's Fish Passage RPM. From these elevations linear regressions were run and provided an estimation of flowlines; and the

expected depth culverts should be countersunk in order for natural geomorphic processes to occur within the box.

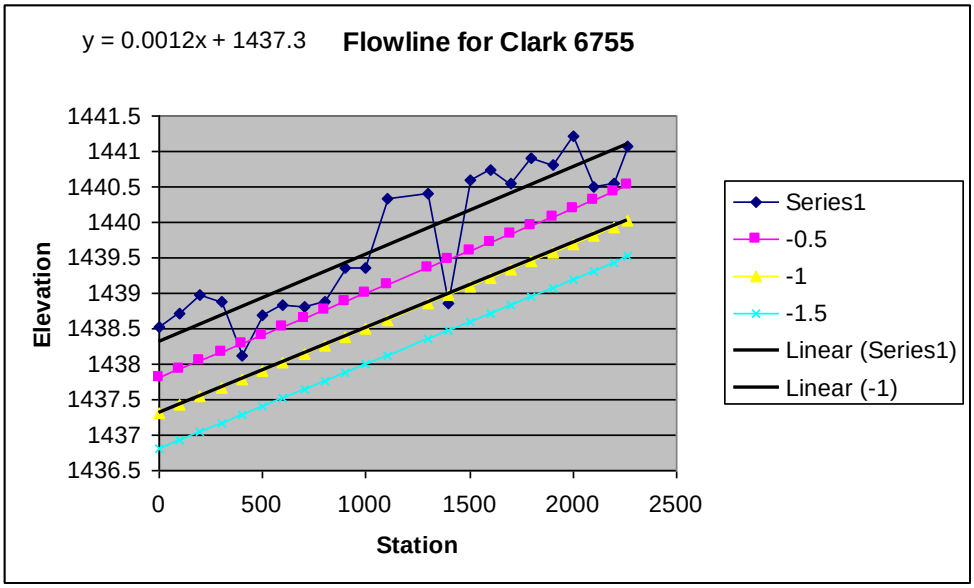

Figure 1: Flowline regression for a project in Clark County (scheduled for 2012). "Series 1" is the actual elevations provided by our consultants, with this data a trendline is set (and can be seen in the highest solid black line). This is our expected flowline given the data and an elevation for the structure can be identified at the roadway station (in this example the roadway is at station 1000). Scour can be seen in front of and behind the roadway. Data series labeled with a (-) indicate possible culvert floor elevations.

Furthermore, the newest policy by the U.S. Army Corps of Engineers (COE) will also require new culverts and pipes at most stream-crossing projects to be countersunk a minimum of 12 inches. This new COE rule went into effect in March 2012.

In addition to ensuring fish passage by sinking the culvert floor, bankfull width of the channel is also measured based on the Q2 (normal discharge elevation) at five locations upstream and five locations downstream of the culvert or bridge. All channel profiles are provided by our consultants and have been standardized to every hundred feet for each measurement. Anomalies in the stream are bypassed, such as the area in close proximity to the structure or an area in which two streams come together, to give a more

accurate representation of the stream channel. From this data an average bankfull width is determined, multiplied by 1.2 and then compared to the widths of potential structure options. Structure options typically take this measurement into consideration already; if they have not then we require redesign of the structure.

The second RPM for the 2008 Opinion is to minimize fish mortality. RPM's 2 and 3 will be listed for each project in Table 3. Seining was conducted at six sites in 2012. Of these six sites, construction activities were completed at only five in calendar year 2012. It is expected that the sixth seining site will be included in the Annual Report for calendar year 2013. Two sites where seining was conducted in 2011 (00L4, 6162) are also included in this report, since construction activities were completed in 2012.

Monitoring

RPM four refers to the monitoring of all replaced structures found to "Adversely Affect" Topeka shiners. During development of the Monitoring Program, a number of data sources were examined. Wayne Stancill (FWS), Nathan Morey (COE), and Ryan Huber (SDDOT) provided necessary information on measurements for such a program. The Monitoring Program Plan "**South Dakota Fish Passage Monitoring Protocol for Projects Regulated by the 2008 Programmatic Biological Opinion: Stream Crossing Projects Administered/Funded by the South Dakota Department of Transportation and the Federal Highway Administration**" was completed and approved by FWS, FHWA, and SDDOT in July, 2012 (Appendix III).

After approval of the Monitoring Program Plan, representatives from FWS, FHWA, and SDDOT continued to discuss and revise data collection methods and

guidelines. In October 2012, this group agreed upon a set of data collection guidelines and a '**SDDOT Fish Passage Assessment Work Sheet**' for use in 2012. Monitoring of 34 structures with a determination of 'May Affect, Likely to Adversely Affect' Topeka shiners, which were constructed 2009 – 2011, was completed in November 2012. As indicated in the Monitoring Plan, monitoring reports will be completed, included, and disseminated with the Annual Compliance Report (Appendix IV). Within one month of distribution of the annual report (or other agreed time agreed to by all parties), the FWS, FHWA, and SDDOT will meet to review monitoring report findings. During this annual meeting the group will also evaluate effectiveness of the data being collected on the 'SDDOT Fish Passage Assessment Work Sheet'. Revisions will be discussed and implemented as needed to meet the terms and conditions of the 2008 Biological Opinion.

Turbidity Monitoring:

For these projects, monitoring of turbidity around the construction sites is required to ensure that measurements remain within 50 NTU's of the background turbidity. All engineers have been provided with our Turbidity Reporting Form. Engineers are informed during preconstruction meetings of the need to monitor turbidity at stream-crossing construction projects. They are also informed of the need to provide copies of completed Turbidity Reporting Forms to the DOT Environmental Office within 14 days of each measurement. Observations will be made on and off through the coming field season to check use and implementation of turbidity meters. This will also be for quality assurance purposes.

Training and Research

The last two RPM's which will be discussed are numbers 5 (training) and 7 (new scientific information). As listed in the Opinion, RPM 5 is carried out at preconstruction meetings where we ensure that contractors are aware of all requirements for fish passage, any diversion channel work, and all erosion control methods. In addition, turbidity meters are also discussed (when, where, and how to use) in reference to quality assurance. Reporting forms for turbidity meters have been covered and a copy is taken to each preconstruction meeting in case Area Engineers or Project Engineers do not have a copy with them. These forms are completed during construction and observed turbidity, over the background, is double checked for any anomalies.

Department of Transportation (SDDOT) employees and contractors continue to attend Sediment and Erosion Control Training each spring. As of February 20, 2013, approximately 2358 people have gone through the Sediment and Erosion Control Training.

Finally, the most recent Technical Report was written to examine the effects of culverts on Topeka shiners and other warm water fish species in eastern South Dakota. South Dakota Technical Report SD2006-07-F, **"Impacts of Barriers on Topeka Shiner Populations"** was submitted to the DOT Research Division by the Western Transportation Institute. Editorial comments which were sent back to the authors by the Research Committee were incorporated into the final version of the Technical Report.

American Burying Beetle RPMs:

As part of the 2008 Biological Opinion (Opinion), Reasonable and Prudent Measures (RPM's) were also set in place for projects affecting the American burying beetle:

1.) Avoidance or Minimizing Habitat Disturbance (Ground-disturbing Activities) in Riparian and Grassland Habitats
2.) Training
3.) Reporting
4.) Including Current or New Scientific Information

In this document data will be included on each RPM, which can be found in the reporting forms (Appendix II) and in the text to follow.

Summary of Construction Activities:

In this Annual Compliance Report, data related to construction at one box culvert and two bank stabilizations built in the State of South Dakota by the Department of Transportation will be documented (Table 4 and 5). This data will relate to Reasonable and Prudent Measures (RPMs) and Conservation Measures (CMs) indicated in the Biological Opinion: Stream-Crossing projects funded/administered by the South Dakota Department of Transportation and the Federal Highway Administration (Opinion). All structures reported on in this document were completed between January 1st 2012 and December 31st 2012. It should be noted that with limited resources and the complications of locating projects, it is possible that a minimal number of "Affect, Not Likely to Adversely Affect" projects may be missing from this document. It is certain that all

"Affect, Likely to Adversely Affect" projects have been located and totaled for this report. At present, a way to collect and file documents related to the Biological Assessments (B.A.s) is being devised.

For one construction project within the American burying beetle range during 2012, 0.75 acres of riparian area was temporarily affected by vehicles or construction activities.

Summary of Habitat Impacts:

One project in 2012 was listed to "Affect, Likely to Adversely Affect" the American burying beetle; and 2 projects were listed "Affect, Not Likely to Adversely Affect" the American burying beetle (Table 4). The RPM's of the Opinion are applied on projects which will "Adversely Affect." This is due to the fact that anticipated "take" of American burying beetle is expected to be zero at sites "Not Likely to Adversely Affect."

The one stream crossing permanently impacted 129 feet of stream channel. This length of channel impact is primarily due to placement of structure, riprap scour protection in the stream and along the banks of the stream. Riprap at the inlet and outlet of the box culvert made up approximately 51 feet of stream channel impact. Placement of riprap was the primary cause of this impact with some affect being the riprap placed for abutment protection at bridges. The remaining 78 feet of impacts to the channel is due to replacing an old structure with a new longer structure (Table 5).

Avoidance or Minimizing Habitat Disturbance (Ground-disturbing Activities)

The first RPM for the 2008 Opinion is to minimize riparian and grassland habitat during construction of stream crossing structures. During the environmental clearance process, we ensure that contractors, Area Engineers, and Project Engineers are aware of all requirements for minimizing ground-disturbing activities in riparian and grassland communities located within Tripp, Todd, Gregory, and Bennett counties. We continue to provide this information at TS&L and preconstruction meetings within known American burying beetle range. Riparian and grassland habitats are avoided with exception of activities critical to the construction process and that are specified in the project plans. Ground disturbing activities outside of the project work limits are reviewed by the SDDOT environmental office and are not allowed if those activities may impact the American burying beetle. All efforts are made to minimize the construction footprint at these sites.

Training and Research

As listed in the Opinion, RPM 2 is carried out at preconstruction meetings where we ensure that contractors and Project Engineers are aware of all requirements for minimizing ground-disturbing activities in riparian and grassland communities. Area Engineers and Project Engineers within known American burying beetle range are made aware of all requirements of the 2008 Biological Opinion.

Table 1. Project identification, location, and Topeka shiner determination for stream crossing projects covered that involved construction between January 1, 2012 and December 31, 2012. Only projects affecting the Topeka shiner are included in this table. Projects determined to "Affect, likely to adversely affect" this species are signified by ALTAA. Projects determined to "Affect, not likely to adversely affect" this species are signified by ANLTAA.

PCN	County	Project Number	Structure Number	Stream	Latitude	Longitude	Topeka shiner Status
01DU	McCook	BRF 6344(15)	44-006-170	Wolf Creek	43.3603	-97.3543	ALTAA
00ZH	Lake, Moody	BRF 6320(04)	40-239-030	Battle Creek	44.15278155	-96.888918	ALTAA
00KS	Clay	CS 8014(30)	14-141-070	Baptist Creek	42.98245	-96.8836	ALTAA
01DS	Aurora	BRF 6169(05)	02-040-063	Unnamed Creek	43.8448	-98.71425	ALTAA
5551	Lincoln	BRF 6116(2)	42-026-260	Blind Creek	43.12728	-96.87315	ALTAA
01P0	Davison	P 6042(02)	18-042-210	Trib. To Twelve Mile Creek	43.54159	-98.24060	ALTAA
01D3	Hutchinson	P 0025(58)07	34-202-187	S. Branch Lonetree Creek	43.23018	-97.71452	ALTAA
01D3	Bon Homme	P 0025(58)07	05-230-027	Trib. To Dawson Creek	43.1309	-97.71594	ALTAA
026L	Lincoln	P 0017(07)43	42-020-025	Trib. To Beaver Creek	43.46893937	-96.886240	ALTAA
6162	Hutchinson	P-BRF 0018(134)394	34-268-180	Trib. To James River	43.24092	-97.58165	ALTAA
H034	Minnehaha	P-PH 0038(27)348	50-161-170	Trib. To Willow Creek	43.60194407	-96.808400	ALTAA
H034	Minnehaha	P-PH 0038(27)348	50-115-164	Trib. To Skunk Creek	43.6122	-96.9008	ALTAA
0243	Turner	P 019(33)31	None	Trib. To Frog Creek	43.1033	-97.0810	ALTAA
0243	Turner	P 019(33)31	None	Frog Creek	43.1060	-97.0819	ALTAA
000U	Grant	IM 0297(33)193	None	Trib. To Soo Creek	45.16653	-97.05639	ALTAA
000U	Grant	IM 0297(33)193	None	Trib. To Indian River	45.19730	-97.05534	ALTAA
00L8	Beadle	NH 001(156)357	03-359-180	Pearl Creek	44.36884	-97.97537	ALTAA
00L8	Beadle	NH 001(156)357	03-393-180	Middle Pearl Creek	44.3689	-97.90818	ALTAA
00L4	Brown	NH 0281(81)187	07-100-342	Foot Creek	45.4425	-98.5155	ALTAA
029X	Hanson	BRF 0042(39)313	31-094-210	Bloom Creek	43.5434	-97.7773	ALTAA
029X	Hanson	BRF 0042(39)313	31-103-210	Bloom Creek	43.5434	-977625	ALTAA
4636	Lake	BRO 8040(09)	40-232-040	Trib. To Battle Creek	44.13847676	-96.904156	ANLTAA
6755	Clark	BRF 6299(2)	13-030-269	Foster Creek	44.76333893	-97.917136	ANLTAA
6784	Clark	BRF 8013(10)	13-010-266	Foster Creek	44.76859703	-97.957760	ANLTAA

Table 2. Stream length impacted by the new stream crossing (2012) and stream length impacted by the previous stream crossing. Structure width was defined as the opening width of a culvert including all barrels or the opening width of a bridge measured from abutment to abutment. Structure length was defined as the longitudinal length of stream channel impacted by a culvert, bridge abutment, or bridge column. Total impacted length was defined as the longitudinal stream length impacted by both the stream crossings structure and riprap scour protection.

PCN	Structure Number	Old Structure Type	Old Structure Length (ft)	Old Structure Width (ft)	New Structure Type	New Structure Length (ft)	New Structure Width (ft)	Total Impacted Length (ft)
01DU	44-006-170	Bridge	24.00	71.00	Bridge	36.00	94.00	100
00ZH	40-239-030	Bridge	30.60	61.80	Bridge	32.50	90.00	120
00KS	14-141-070	Bridge	28.00	45.00	Box Culvert	82.50	24.50	130
01DS	02-040-063	Bridge	32.00	62.75	Box Culvert	63.00	30.00	240
5551	42-026-260	Box Culvert	36.00	32.00	Box Culvert	79.75	37.50	120
01P0	18-042-210	Box Culvert	51.00	10.00	Box Culvert	142.00	10.00	194
01D3	15-196-190	Box Culvert	64.00	20.00	Box Culvert	142.00	24.50	160
01D3	05-230-027	Box Culvert	58.50	20.00	Box Culvert	122.75	20.75	145
026L	42-020-025	Box Culvert, CMP	49.00	7.00	Box Culvert	116.00	8.00	190
6162	34-268-180	CMP	120.00	10.00	Box Culvert	190.00	11.00	200
H034	50-161-170	Box Culvert	50.00	30.00	Box Extension	84.00	30.00	90
H034	50-115-164	Box Culvert	156.00	12.00	Box Extension	180.00	12.00	200
0243	None	RCP	58.00	5.00	Pipe Extension	66.00	5.00	70
0243	None	RCP	58.67	30.50	Pipe Extension	102.67	30.50	120
000U	None	RCP	294.00	7.00	RCP Repair	294.00	7.00	300
000U	None	RCP	122.00	5.50	Scour Repair	122.00	5.50	162
00L8	03-359-180	Bridge	44.00	93.00	Scour Protection	44.00	93.00	120
00L8	03-393-180	Bridge	44.00	99.00	Scour Protection	44.00	99.00	120
00L4	07-100-342	Bridge	150.00	93.00	Scour Protection	150.00	93.00	170
029X	31-094-210	Bridge	30.00	80.00	Scour Protection	30.00	80.00	110
029X	31-103-210	Bridge	34.00	80.00	Scour Protection	34.00	80.00	80

Table 3. A summary of RPMs implemented at 2012 projects that were "Likely to Adversely Affect" the Topeka shiner. A description of the RPMs listed in this table is given in the introduction of this report.

PCN	Structure #	RPM 1	RPM 2	RPM 3	RPM 4	RPM 5	RPM 6	RPM 7
01DU	44-006-170	Yes*	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
00ZH	40-239-030	Yes*	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
00KS	14-141-070	Yes	Yes	Yes	Yes	Yes	Yes	Yes
01DS	02-040-063	Yes	Yes	Yes	Yes	Yes	Yes	Yes
5551	42-026-260	Yes	Yes	Yes	Yes	Yes	Yes	Yes
01P0	18-042-210	Yes	Yes	Yes	Yes	Yes	Yes	Yes
01D3	15-196-190	Yes	Yes	Yes	Yes	Yes	Yes	Yes
01D3	15-230-027	Yes	Yes	Yes	Yes	Yes	Yes	Yes
026L	42-020-025	Yes	Yes					
6162	34-268-180	Yes	Yes	Yes	Yes	Yes	Yes	Yes
H034	50-161-170	Yes	Yes	Yes	Yes	Yes	Yes	Yes
H034	50-115-164	Yes	Yes	Yes	Yes	Yes	Yes	Yes
0243	None	Yes	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
0243	None	Yes	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
00UU	None	Yes	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
00UU	None	Yes	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
00L8	03-359-180	Yes*	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
00L8	03-393-180	Yes*	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
00L4	07-100-342	Yes*	Yes	Yes	Yes	Yes	Yes	Yes
029X	31-094-210	Yes*	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes
029X	31-103-210	Yes*	Not Applicable ‡	Yes	Yes	Yes	Yes	Yes

‡ Structures did not utilize a diversion channel, therefore, not requiring fish removal but all projects did comply with water withdrawal.

* These structures were bridges, by USFWS permission, which did not require sinking but all other fish passage measures were implemented.

Table 4. Project identification, location, and American burying beetle determination for stream crossing projects covered that involved construction between January 1, 2012 and December 31, 2012. Only projects affecting the American burying beetle are included in this table. Projects determined to "Affect, likely to adversely affect" this species are signified by ALTAA. Projects determined to "Affect, not likely to adversely affect" this species are signified by ALTAA.

PCN	County	Project Number	Structure Number	Stream	Latitude	Longitude	American Burying Beetle Status
012E	Tripp	BRF 6142(01)	62-330-380	Ponca Creek	43.22666	-99.59329	ALTAA
032Q	Gregory	P0044(168)284	None	Trib. to Lake Francis Case	43.3770	-99.59329	**ANLTAA**
032Q	Gregory	P0044(168)284	None	Rush Creek	43.3871	-992360	**ANLTAA**

Table 5. Stream length impacted by the new stream crossing (2012) and stream length impacted by the previous stream crossing. Structure width was defined as the opening width of a culvert including all barrels or the opening width of a bridge measured from abutment to abutment. Structure length was defined as the longitudinal length of stream channel impacted by a culvert, bridge abutment, or bridge column. Total impacted length was defined as the longitudinal stream length impacted by both the stream crossings structure and riprap scour protection.

PCN	Structure Number	Old Structure Type	Old Structure Length (ft)	Old Structure Width (ft)	New Structure Type	New Structure Length (ft)	New Structure Width (ft)	Total Impacted Length (ft)
012E	62-330-380	Bridge	20.00	32.00	Box Culvert	78.00	24.50	129.0

Table 6. A summary of RPMs implemented at 2012 projects that were "Likely to Adversely Affect" the American burying beetle. A description of the RPMs listed in this table is given on page 11 of this report.

PCN	Structure #	RPM 1	RPM 2	RPM 3	RPM 4
012E	62-330-380	Yes	Yes	Yes	Yes

Appendix I. Individual stream crossing reporting forms for projects that were constructed in 2012 and also impacted the Topeka shiner.

SDDOT Project Reporting Form

PCN:	01DU	DOT Region:	Mitchell
Project Number:	BRF 6344(15)	DOT Area:	Mitchell
Structure Number:	44-006-170	Project Biologist:	Craig Olawsky
Latitude:	43.3603	Project Engineer:	Scott Schneider
Longitude:	-97.3543	Primary Contractor:	Graves Construction
County:	McCook	Start Date:	8/27/2012
Stream Name:	Wolf Creek	Completion Date:	11/15/2012
Watershed:	James	Existing Structure:	Bridge
Structure Ownership:	County	New Structure:	Bridge

Stream Habitat

Description of stream habitat: Classic prairie stream habitat. Adjacent land use is pasture.

Impacts to Stream Habitat:

Disturbed Area (acres):	1.34
Structure Length (ft):	36.00
Permanent Impacted Length (ft):	100.00
Structure Width (ft):	94.00
Length Previous Structure (ft):	24.00
Width of Previous Structure (ft):	71.00
Countersink Depth (inches):	Not applicable

Comments: This project was a bridge and had minimal impact to the active stream channel.

Diversion Channel

Diversion channel type: A diversion was not used.
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Regular stream flows during construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: High flow silt fence, erosion control wattle, straw mulching, type 2 erosion control blanket, class C riprap, floating silt curtain, permanent seeding.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present:	Construction site was not isolated from normal flows; no seining was required.
Topeka shiner mortality:	Presumed to be zero

Comments: None

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	00ZH	DOT Region:	Mitchell
Project Number:	BRF 6320(04)	DOT Area:	Sioux Falls
Structure Number:	40-239-030	Project Biologist:	Craig Olawsky
Latitude:	44.15278155	Project Engineer:	Mike Border
Longitude:	-96.8889188	Primary Contractor:	Graves Construction
County:	Lake & Moody	Start Date:	08/01/2012
Stream Name:	Battle Creek	Completion Date:	11/19/2012
Watershed:	Big Sioux	Existing Structure:	Bridge
Structure Ownership:	County	New Structure:	Bridge

Stream Habitat

Description of stream habitat: Classic prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.90
Structure Length (ft):	32.5
Permanent Impacted Length (ft):	120.00
Structure Width (ft):	90.00
Length Previous Structure (ft):	30.60
Width of Previous Structure (ft):	61.80
Countersink Depth (inches):	Not applicable

Comments: This project was a bridge and had minimal impact to the active stream channel.

Diversion Channel

Diversion channel type: A diversion channel was not used.
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Minimal late summer/autumn flow. 2012 was a drought year.

Comments: A temporary rock stream crossing was constructed for construction equipment access. A 36" corrugated metal pipe was installed through the rock stream crossing to maintain water flow and provide fish passage during construction.

Erosion and Sediment Control

BMPs implemented: High flow silt fence, floating silt curtain, vegetated buffer, mulching, riprap, permanent seeding.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present:	Construction site was not isolated from normal flows, no seining was required.
Topeka shiner mortality:	Presumed to be zero.

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	00KS	DOT Region:	Mitchell
Project Number:	CS 8014(30)	DOT Area:	Yankton
Structure Number:	14-141-070	Project Biologist:	Craig Olawsky
Latitude:	42.98245	Project Engineer:	Kevin Heiman
Longitude:	-96.8836	Primary Contractor:	Nolz Construction
County:	Clay	Start Date:	07/30/2012
Stream Name:	Baptist Creek	Completion Date:	09/25/2012
Watershed:	Vermillion	Existing Structure:	Timber Bridge
Structure Ownership:	County	New Structure:	Box Culvert

Stream Habitat

Description of stream habitat: Completely dry. 2012 was a drought year.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.68
Structure Length (ft):	82.50
Permanent Impacted Length (ft):	130.00
Structure Width (ft):	24.50 (twin 12')
Length Previous Structure (ft):	28.00
Width of Previous Structure (ft):	45.00
Countersink Depth (inches):	6

Comments: The new culvert is wider than the bankfull stream channel and is not expected to impact channel morphology or fish movement.

Diversion Channel

Diversion channel type:	Fabric lined excavated channel
Temporary water barrier type:	Steel sheet pile
Date installation:	08/04/2012
Date removed:	09/25/2012

Description of stream flow: Stream was dry during construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Low flow silt fence, erosion control wattle, erosion control blanket, vegetated buffer, riprap, steel sheeting, straw mulching, permanent seeding.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present: Stream was dry. No seining was required.
Topeka shiner mortality: 0

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	01DS	DOT Region:	Mitchell
Project Number:	BRF 6169(05)	DOT Area:	Mitchell
Structure Number:	02-040-063	Project Biologist:	Craig Olawsky
Latitude:	43.8448	Project Engineer:	Ron Gillen
Longitude:	-98.71425	Primary Contractor:	Dakota Contracting Corp.
County:	Aurora	Start Date:	7/23/2012
Stream Name:	Unnamed creek	Completion Date:	10/23/2012
Watershed:	James	Existing Structure:	Bridge
Structure Ownership:	County	New Structure:	Box Culvert

Stream Habitat

Description of stream habitat: Intermittent prairie stream, tributary to White Lake. Stream was completely dry except for a scour hole directly under the bridge. 2012 was a drought year.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.61
Structure Length (ft):	63.00
Permanent Impacted Length (ft):	240.00
Structure Width (ft):	30.00
Length Previous Structure (ft):	32.00
Width of Previous Structure (ft):	62.75
Countersink Depth (inches):	12

Comments: The new culvert is wider than the bankfull stream channel and is not expected to impact channel morphology or fish movement.

Diversion Channel

Diversion channel type:	Fabric lined excavated channel
Temporary water barrier type:	Steel sheet pile
Date installation:	7/26/2012
Date removed:	10/9/2012

Description of stream flow: Stream channel was completely dry except for a scour hole directly under the bridge. Water depth in the hole was approximately 3 feet.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Silt fence, vegetated buffer, steel sheeting, riprap, straw mulching, permanent seeding.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present:	No Topeka shiners were found during seining event.
Topeka shiner mortality:	Presumed to be zero

Comments: Other species included black bullhead, green sunfish, brassy minnows, crayfish.

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	5551	DOT Region:	Mitchell
Project Number:	BRF 6116(2)	DOT Area:	Yankton
Structure Number:	42-026-260	Project Biologist:	Craig Olawsky
Latitude:	43.12728	Project Engineer:	Kevin Heiman
Longitude:	-96.87315	Primary Contractor:	Nolz Construction
County:	Lincoln	Start Date:	04/02/2012
Stream Name:	Blind Creek	Completion Date:	06/22/2012
Watershed:	Vermillion	Existing Structure:	Box Culvert
Structure Ownership:	County	New Structure:	Box Culvert

Stream Habitat

Description of stream habitat: Classic Topeka shiner stream habitat

Impacts to Stream Habitat:

Disturbed Area (acres):	0.46
Structure Length (ft):	79.75
Permanent Impacted Length (ft):	120.00
Structure Width (ft):	37.50 (3 – 12')
Length Previous Structure (ft):	36.00
Width of Previous Structure (ft):	32.00 (4 – 8')
Countersink Depth (inches):	6

Comments: The new culvert is wider than the bankfull stream channel and is not expected to impact channel morphology or fish movement.

Diversion Channel

Diversion channel type:	Fabric lined excavated channel
Temporary water barrier type:	Steel sheet pile
Date installation:	04/12/2012
Date removed:	06/21/2012

Description of stream flow: Regular stream flows during construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: High flow silt fence, erosion control wattle, vegetated buffer, riprap, steel sheeting, straw mulching, permanent seeding.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present:	2
Topeka shiner mortality:	Presumed to be zero. Topeka shiners swam away after release outside of the work area.

Comments: Other species included brassy minnow, Iowa darter, black bullhead, green sunfish, creek chub, white sucker.

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	01P0	DOT Region:	Mitchell
Project Number:	P 6042(02)	DOT Area:	Mitchell
Structure Number:	18-042-210	Project Biologist:	Craig Olawsky
Latitude:	43.54159	Project Engineer:	Andrew Kangas
Longitude:	-98.24060	Primary Contractor:	Loiseau Construction
County:	Davison	Start Date:	7/9/2012
Stream Name:	Trib. to Twelve Mile Creek	Completion Date:	11/5/2012
Watershed:	James	Existing Structure:	Box Culvert
Structure Ownership:	County	New Structure:	Box Culvert

Stream Habitat

Description of stream habitat: Intermittent prairie stream. Stream was completely dry.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.45
Structure Length (ft):	142.00
Permanent Impacted Length (ft):	194.00
Structure Width (ft):	10.00
Length Previous Structure (ft):	51.00
Width of Previous Structure (ft):	10.00
Countersink Depth (inches):	0

Comments: The new culvert is wider than the bankfull stream channel and is not expected to impact channel morphology or fish movement. The culvert was realigned to match the channel and elevation was set to match the channel flow line per the hydraulic data sheet. This structure will be monitored under the new Monitoring Protocol (Appendix III).

Diversion Channel

Diversion channel type:	Fabric lined excavated channel
Temporary water barrier type:	Steel sheet pile
Date installation:	7/13/2012
Date removed:	7/25/2012

Description of stream flow: Completely dry. 2012 was a drought year.

Comments: Allowed Tributary of Twelve Mile Creek to continue to run through the existing box culvert as the diversion channel while the new box culvert was installed.

Erosion and Sediment Control

BMPs implemented: High flow silt fence, vegetated buffer, steel sheeting, straw mulching, erosion control wattle, erosion bales, type 3 erosion control blanket, permanent seeding, riprap.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present:	Stream was dry. No seining was required
Topeka shiner mortality:	0

Comments: None

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	001D3	DOT Region:	Mitchell
Project Number:	P 0025(58)07	DOT Area:	Yankton
Structure Number:	34-202-187	Project Biologist:	Craig Olawsky
Latitude:	43.23018	Project Engineer:	Joe Sestak
Longitude:	-97.71452	Primary Contractor:	McLaughlin & Schulz
County:	Hutchinson	Start Date:	04/25/2012
Stream Name:	South Branch Lonetree Creek	Completion Date:	12/03/2012
Watershed:	James	Existing Structure:	Box Culvert
Structure Ownership:	State	New Structure:	Box Culvert

Stream Habitat

Description of stream habitat: Classic prairie stream habitat. Gravel stream bottom.

Impacts to Stream Habitat:

Disturbed Area (acres):	1.50
Structure Length (ft):	142.00
Permanent Impacted Length (ft):	160.00
Structure Width (ft):	24.50 (twin 12')
Length Previous Structure (ft):	64.00
Width of Previous Structure (ft):	20.00
Countersink Depth (inches):	12

Comments: The new culvert is wider than the bankfull stream channel and is not expected to impact channel morphology or fish movement.

Diversion Channel

Diversion channel type:	Fabric lined excavated channel
Temporary water barrier type:	Steel sheet pile
Date installation:	04/30/2012
Date removed:	07/23/2012

Description of stream flow: Normal stream flow for the duration of construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Low flow silt fence, high flow silt fence, erosion control wattle, erosion control blanket, soil stabilizer, vegetated buffer, turf reinforcement mat, steel sheeting, mulching, permanent seeding.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present:	2
Topeka shiner mortality:	Presumed to be zero. Topeka shiners swam away after release outside of the work area.

Comments: Other species included brassy minnow, central stoneroller, Johnny darter, red shiner, green sunfish, creek chub, white sucker.

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	001D3	DOT Region:	Mitchell
Project Number:	P 0025(58)07	DOT Area:	Yankton
Structure Number:	05-230-027	Project Biologist:	Craig Olawsky
Latitude:	43.1309	Project Engineer:	Joe Sestak
Longitude:	-97.71594	Primary Contractor:	McLaughlin & Schulz
County:	Bon Homme	Start Date:	04/25/2012
Stream Name:	Trib. To Dawson Creek	Completion Date:	12/03/2012
Watershed:	James	Existing Structure:	Box Culvert
Structure Ownership:	State	New Structure:	Box Culvert

Stream Habitat

Description of stream habitat: Classic prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.80
Structure Length (ft):	122.75
Permanent Impacted Length (ft):	145.00
Structure Width (ft):	20.75 (twin 10')
Length Previous Structure (ft):	58.50
Width of Previous Structure (ft):	20.00
Countersink Depth (inches):	12

Comments: The new culvert is wider than the bankfull stream channel and is not expected to impact channel morphology or fish movement.

Diversion Channel

Diversion channel type:	Fabric lined excavated channel
Temporary water barrier type:	Steel sheet pile
Date installation:	06/27/2012
Date removed:	09/25/2012

Description of stream flow: Normal to low stream flow for the duration of construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Low flow silt fence, high flow silt fence, erosion control wattle, erosion control blanket, soil stabilizer, vegetated buffer, steel sheeting, mulching, permanent seeding.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present:	No Topeka shiners were found during seining event.
Topeka shiner mortality:	Presumed to be zero.

Comments: Species included brassy minnow, black bullhead, turtle sp.

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	026L	DOT Region:	Mitchell
Project Number:	P 0017(07)43	DOT Area:	Sioux Falls
Structure Number:	42-020-025	Project Biologist:	Craig Olawsky
Latitude:	43.46893937	Project Engineer:	Harvey Odens
Longitude:	-96.88624036	Primary Contractor:	Duininck Inc.
County:	Lincoln	Start Date:	05/14/2012
Stream Name:	Trib. To Beaver Creek	Completion Date:	10/15/2012
Watershed:	Big Sioux	Existing Structure:	Box Culvert & 54" CMP
Structure Ownership:	State	New Structure:	Box Culvert

Stream Habitat

Description of stream habitat: Typical intermittent prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	1.30
Structure Length (ft):	116.00
Permanent Impacted Length (ft):	190.00
Structure Width (ft):	8.00
Length Previous Structure (ft):	49.00
Width of Previous Structure (ft):	7.00
Countersink Depth (inches):	12

Comments:

Diversion Channel

Diversion channel type:	An existing 54" corrugated metal pipe at Sta. 276+76 was used as a diversion channel. Steel sheeting was installed on the inlet side to prevent water from diverting to the box culvert work site. The outlet end of the work site was not opened to the creek until the work was complete.
Temporary water barrier type:	Steel sheet pile
Date installation:	06/28/2012 (for steel sheeting)
Date removed:	08/07/2012 (for steel sheeting)

Description of stream flow: Low stream flow for the duration of construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: High flow silt fence, low flow silt fence, floating silt curtain, vegetated buffer, mulching, turf reinforcement mat, erosion control wattles, riprap, soil stabilizer, flocculent, permanent seeding.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present:	Because this project did not dewater or isolate stream habitat, fish seining was not necessary.
Topeka shiner mortality:	Presumed to be zero.

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	6162	DOT Region:	Mitchell
Project Number:	P-BRF 0018(134)394	DOT Area:	Yankton
Structure Number:	34-268-180	Project Biologist:	Ryan Huber
Latitude:	43.24092	Project Engineer:	Greg Putnam
Longitude:	-97.58165	Primary Contractor:	Slowey Construction
County:	Hutchinson	Start Date:	03/21/2011
Stream Name:	Trib. to James River	Completion Date:	06/18/2012
Watershed:	James	Existing Structure:	CMP
Structure Ownership:	State	New Structure:	Box Culvert

Stream Habitat

Description of stream habitat: Typical prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.80
Structure Length (ft):	190.00
Permanent Impacted Length (ft):	200.00
Structure Width (ft):	11.00
Length Previous Structure (ft):	120.00
Width of Previous Structure (ft):	10.00 (twin 60” cor. metal pipe)
Countersink Depth (inches):	12

Comments: The new culvert is wider than the bankfull stream channel and is not expected to impact channel morphology or fish movement.

Diversion Channel

Diversion channel type:	Fabric lined excavated channel
Temporary water barrier type:	Steel sheet pile
Date installation:	05/10/2011
Date removed:	08/17/2011

Description of stream flow: Normal to minimal stream flow during construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Low flow silt fence, high flow silt fence, erosion control wattle, erosion control blanket, soil stabilizer, vegetated buffer, steel sheeting, mulching, permanent seeding, riprap.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present:	No Topeka shiners were found during seining event.
Topeka shiner mortality:	Presumed to be zero.

Comments: Other species included brassy minnow, green sunfish, black bullhead, creek chub.

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	H034	DOT Region:	Mitchell
Project Number:	P-PH 0038(27)348	DOT Area:	Sioux Falls
Structure Number:	50-161-170	Project Biologist:	Craig Olawsky
Latitude:	43.60194407	Project Engineer:	Harvey Odens
Longitude:	-96.80840055	Primary Contractor:	Central Specialties
County:	Minnehaha	Start Date:	03/07/2012
Stream Name:	Trib. To Willow Creek	Completion Date:	11/23/2012
Watershed:	Big Sioux	Existing Structure:	Box Culvert
Structure Ownership:	State	New Structure:	Box Culvert Extension

Stream Habitat

Description of stream habitat: Typical prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.15
Structure Length (ft):	84.00
Permanent Impacted Length (ft):	90.00
Structure Width (ft):	30.00 (triple 10')
Length Previous Structure (ft):	50.00
Width of Previous Structure (ft):	30.00 (triple 10')
Countersink Depth (inches):	Not applicable

Comments: The existing triple 10'x8'x50' box culvert was extended 17' at both the inlet and outlet ends.

Diversion Channel

Diversion channel type:	Fabric lined excavated channel
Temporary water barrier type:	Steel sheeting
Date installation:	04/23/2012
Date removed:	06/29/2012

Description of stream flow: Low flow

Comments: No diversion channel was used. Steel sheeting was installed upstream and downstream to isolate the work area. Water was pumped through the box culvert whenever a rain event occurred. The work area was seined prior to dewatering. The inlet of the pump was protected by screens.

Erosion and Sediment Control

BMPs implemented: Silt fence, erosion control wattle, erosion control blanket, vegetated buffer, steel sheeting, mulching, cover crop seeding, permanent seeding, riprap.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present:	No Topeka shiners were found during seining event.
Topeka shiner mortality:	Presumed to be zero.

Comments: Other species included black bullhead, brassy minnow.

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	H034	DOT Region:	Mitchell
Project Number:	P-PH 0038(27)348	DOT Area:	Sioux Falls
Structure Number:	50-115-164	Project Biologist:	Craig Olawsky
Latitude:	43.6122	Project Engineer:	Harvey Odens
Longitude:	-96.9008	Primary Contractor:	Central Specialties
County:	Minnehaha	Start Date:	03/07/2012
Stream Name:	Trib. To Skunk Creek	Completion Date:	11/23/2012
Watershed:	Big Sioux	Existing Structure:	Box Culvert
Structure Ownership:	State	New Structure:	Box Culvert Extension

Stream Habitat

Description of stream habitat: Classic prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.12
Structure Length (ft):	180.00
Permanent Impacted Length (ft):	200.00
Structure Width (ft):	12.00
Length Previous Structure (ft):	156.00
Width of Previous Structure (ft):	12.00
Countersink Depth (inches):	Not applicable

Comments: The existing 12’x12’x156’ box culvert was extended 24’ at the inlet.

Diversion Channel

Diversion channel type:	No diversion was used.
Temporary water barrier type:	Rock dike
Date installation:	10/16/2012
Date removed:	10/31/2012

Description of stream flow: Completely dry at time of construction.

Comments: No diversion channel was used. A temporary rock dike was installed on the upstream side of the structure. A pump was on site if a rain event occurred.

Erosion and Sediment Control

BMPs implemented: Silt fence, erosion control wattle, erosion control blanket, vegetated buffer, steel sheeting, mulching, cover crop seeding, permanent seeding, riprap.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present: Stream was dry; seining was not required.
Topeka shiner mortality: 0

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	0243	DOT Region:	Mitchell
Project Number:	P 019(33)31	DOT Area:	Yankton
Structure Number:	None	Project Biologist:	Craig Olawsky
Latitude:	43.1033	Project Engineer:	Kevin Heiman
Longitude:	-97.0810	Primary Contractor:	Duininck Inc.
County:	Turner	Start Date:	06/18/2012
Stream Name:	Trib. to Frog Creek	Completion Date:	11/16/2012
Watershed:	Vermillion	Existing Structure:	CMP
Structure Ownership:	State	New Structure:	CMP Extension

Stream Habitat

Description of stream habitat: Completely dry. 2012 was a drought year.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.40
Structure Length (ft):	66.00
Permanent Impacted Length (ft):	70.00
Structure Width (ft):	5.00
Length Previous Structure (ft):	58.00
Width of Previous Structure (ft):	5.00
Countersink Depth (inches):	Not applicable

Comments: An existing 60” (5’) corrugated metal pipe was extended by 8’ (4’ on each end). Pipe extension work was completed in one day (7/3/2012).

Diversion Channel

Diversion channel type: A diversion was not used.
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Stream was dry during construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Vegetated buffer, riprap, straw mulching, permanent seeding.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present: Stream was dry. No seining was required.
Topeka shiner mortality: 0

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	0243	DOT Region:	Mitchell
Project Number:	P 019(33)31	DOT Area:	Yankton
Structure Number:	None	Project Biologist:	Craig Olawsky
Latitude:	43.1060	Project Engineer:	Kevin Heiman
Longitude:	-97.0819	Primary Contractor:	Duininck Inc.
County:	Turner	Start Date:	07/06/2012
Stream Name:	Frog Creek	Completion Date:	07/16/2012
Watershed:	Vermillion	Existing Structure:	Arch CMP
Structure Ownership:	State	New Structure:	Arch CMP Extension

Stream Habitat

Description of stream habitat: Completely dry. 2012 was a drought year.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.46
Structure Length (ft):	102.67
Permanent Impacted Length (ft):	123.00
Structure Width (ft):	30.50 (triple 7'wide + space between parallel pipes)
Length Previous Structure (ft):	58.67
Width of Previous Structure (ft):	30.50 (triple 7' wide + space between parallel pipes)
Countersink Depth (inches):	Not applicable

Comments: Existing triple 84" (7') wide x 64" rise corrugated metal pipes were extended by 44' (22' on each end). Pipe extension work started 7/6/2012 and was completed 7/16/2012.

Diversion Channel

Diversion channel type: A diversion was not used.
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Stream was dry during construction.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Vegetated buffer, riprap, straw mulching, permanent seeding.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present: Stream was dry. No seining was required.
Topeka shiner mortality: 0

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	000U	DOT Region:	Aberdeen
Project Number:	IM 0297(33)193	DOT Area:	Watertown
Structure Number:	N A	Project Biologist:	Craig Olawsky
Latitude:	45.16653	Project Engineer:	Matt Johnson
Longitude:	-97.05639	Primary Contractor:	PCi Roads
County:	Grant	Start Date:	10/04/2012
Stream Name:	Trib. To Soo Creek	Completion Date:	11/27/2012
Watershed:	Big Sioux	Existing Structure:	RCP
Structure Ownership:	State	New Structure:	RCP Repair

Stream Habitat

Description of stream habitat: Typical prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.18
Structure Length (ft):	294.00
Permanent Impacted Length (ft):	300.00
Structure Width (ft):	7.00
Length Previous Structure (ft):	294.00
Width of Previous Structure (ft):	7.00
Countersink Depth (inches):	Not applicable

Comments: Removed and reset 8’ pipe section and end section on an existing 84” (7’) reinforced concrete pipe. Also installed 10 cu yards of riprap for scour protection.

Diversion Channel

Diversion channel type: A diversion was not used
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Dry at time of construction. 2012 was a drought year.

Comments:

Erosion and Sediment Control

BMPs implemented: Silt fence, vegetated buffer, mulching, cover crop seeding, permanent seeding, riprap.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present: Stream was dry; seining was not required.
Topeka shiner mortality: 0

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	000U	DOT Region:	Aberdeen
Project Number:	IM 0297(33)193	DOT Area:	Watertown
Structure Number:	N A	Project Biologist:	Craig Olawsky
Latitude:	45.19730	Project Engineer:	Matt Johnson
Longitude:	-97.05534	Primary Contractor:	PCi Roads
County:	Grant	Start Date:	10/04/2012
Stream Name:	Trib. to Indian River	Completion Date:	11/27/2012
Watershed:	Big Sioux	Existing Structure:	RCP
Structure Ownership:	State	New Structure:	Scour Repair

Stream Habitat

Description of stream habitat: Typical prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.25
Structure Length (ft):	122.00
Permanent Impacted Length (ft):	162.00
Structure Width (ft):	5.50
Length Previous Structure (ft):	122.00
Width of Previous Structure (ft):	5.50
Countersink Depth (inches):	Not applicable

Comments: Installed gabion basket at outlet of existing 66” (5.5’) reinforced concrete pipe due to scour wash-outs.

Diversion Channel

Diversion channel type: A diversion was not used.
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Minimal autumn flow. 2012 was a drought year

Comments:

Erosion and Sediment Control

BMPs implemented: Silt fence, vegetated buffer, mulching, cover crop seeding, permanent seeding, riprap.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present:	Because this project did not dewater or isolate stream habitat, fish seining was not necessary.
Topeka shiner mortality:	Presumed to be zero.

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	00L8	DOT Region:	Aberdeen
Project Number:	NH 001(156)357	DOT Area:	Huron
Structure Number:	03-359-180	Project Biologist:	Craig Olawsky
Latitude:	44.36884	Project Engineer:	Nathan Stearns
Longitude:	-97.97537	Primary Contractor:	Graves Construction
County:	Beadle	Start Date:	09/05/2012
Stream Name:	Pearl Creek	Completion Date:	10/04/2012
Watershed:	James	Existing Structure:	Bridge
Structure Ownership:	State	New Structure:	Same – Scour Protection Only

Stream Habitat

Description of stream habitat: Typical prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.28
Structure Length (ft):	44.00
Permanent Impacted Length (ft):	120.00
Structure Width (ft):	93.00
Length Previous Structure (ft):	44.00
Width of Previous Structure (ft):	93.00
Countersink Depth (inches):	Not applicable

Comments: Scour protection (riprap) placed on berm embankments under the bridge; and extending out 25.50’ both upstream and downstream of the bridge along the stream channel. No riprap was placed within the stream channel.

Diversion Channel

Diversion channel type: A diversion was not used.
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Low flow at time of construction. 2012 was a drought year.

Comments: None.

Erosion and Sediment Control

BMPs implemented: High flow silt fence, floating silt curtain, erosion control wattle, vegetated buffer, mulching, permanent seeding.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present:	All work occurred outside of the stream channel; no seining was required.
Topeka shiner mortality:	Presumed to be zero.

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	00L8	DOT Region:	Aberdeen
Project Number:	NH 001(156)357	DOT Area:	Huron
Structure Number:	03-393-180	Project Biologist:	Craig Olawsky
Latitude:	44.3689	Project Engineer:	Nathan Stearns
Longitude:	-97.90818	Primary Contractor:	Graves Construction
County:	Beadle	Start Date:	09/05/2012
Stream Name:	Middle Pearl Creek	Completion Date:	10/04/2012
Watershed:	James	Existing Structure:	Bridge
Structure Ownership:	State	New Structure:	Same – Scour Protection Only

Stream Habitat

Description of stream habitat: Classic prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.28
Structure Length (ft):	44.00
Permanent Impacted Length (ft):	120.00
Structure Width (ft):	99.00
Length Previous Structure (ft):	44.00
Width of Previous Structure (ft):	99.00
Countersink Depth (inches):	Not applicable

Comments: Scour protection (riprap) placed on berm embankments under the bridge; and lining the entire width of stream channel under the bridge and extending out 16.75’ both upstream and downstream of the bridge.

Diversion Channel

Diversion channel type: A diversion channel was not used
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Dry at time of construction. 2012 was a drought year.

Comments: None.

Erosion and Sediment Control

BMPs implemented: High flow silt fence, floating silt curtain, erosion control wattle, vegetated buffer, mulching, permanent seeding, riprap.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present:	Stream was dry; seining was not required.
Topeka shiner mortality:	0

Comments:

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	00L4	DOT Region:	Aberdeen
Project Number:	NH 0281(81)187	DOT Area:	Aberdeen
Structure Number:	07-100-342	Project Biologist:	Craig Olawsky
Latitude:	45.4425	Project Engineer:	Scott Schneider
Longitude:	-98.5155	Primary Contractor:	Lein Transportation
County:	Brown	Start Date:	11/07/2011
Stream Name:	Foot Creek	Completion Date:	08/24/2012
Watershed:	James	Existing Structure:	Bridge
Structure Ownership:	State	New Structure:	Same – Scour Protection Only

Stream Habitat

Description of stream habitat: Intermittent prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.64
Structure Length (ft):	150.00
Permanent Impacted Length (ft):	170.00
Structure Width (ft):	93.00
Length Previous Structure (ft):	150.00
Width of Previous Structure (ft):	93.00
Countersink Depth (inches):	Not applicable

Comments: Scour protection (riprap) placed on berm embankments under the bridge, and along columns under the bridge.

Diversion Channel

Diversion channel type:	A diversion was not used. Installed sand bag berms to isolate work area, seined, then dewatered inside work area.
Temporary water barrier type:	Plastic lining and large sand bags
Date installation:	11/09/2011
Date removed:	11/20/2011

Description of stream flow: Low stream flow. Water was stagnant with no noticeable stream current.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Silt fence, floating silt curtain, vegetated buffer, mulching, permanent seeding, riprap.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present:	No Topeka shiners were found during seining event.
Topeka shiner mortality:	Presumed to be zero.

Comments: Other species included walleye, green sunfish, black bullhead.

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	029X	DOT Region:	Mitchell
Project Number:	BRF 0042(39)313	DOT Area:	Mitchell
Structure Number:	31-094-210	Project Biologist:	Craig Olawsky
Latitude:	43.5434	Project Engineer:	Kent Gates
Longitude:	-97.7773	Primary Contractor:	VanderPol Dragline
County:	Hanson	Start Date:	11/28/2011
Stream Name:	Bloom Creek	Completion Date:	05/14/2012
Watershed:	James	Existing Structure:	Bridge
Structure Ownership:	County	New Structure:	Same – Scour Protection Only

Stream Habitat

Description of stream habitat: Intermittent prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.34
Structure Length (ft):	30.00
Permanent Impacted Length (ft):	110.00
Structure Width (ft):	80.00
Length Previous Structure (ft):	30.00
Width of Previous Structure (ft):	80.00
Countersink Depth (inches):	Not applicable

Comments: Scour protection (riprap) placed on berm embankments under the bridge; and lining the entire width of stream channel under the bridge and extending out 40’ both upstream and downstream of the bridge.

Diversion Channel

Diversion channel type: A diversion was not used.
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Completely dry. 2012 was a drought year.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Silt fence, vegetated buffer, riprap.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present:	Stream was dry. No seining was required.
Topeka shiner mortality:	0

Comments: None

Impacts to Other Endangered Species: None

Conservation Recommendations:

SDDOT Project Reporting Form

PCN:	029X	DOT Region:	Mitchell
Project Number:	BRF 0042(39)313	DOT Area:	Mitchell
Structure Number:	31-103-210	Project Biologist:	Craig Olawsky
Latitude:	43.5434	Project Engineer:	Kent Gates
Longitude:	-97.77625	Primary Contractor:	VanderPol Dragline
County:	Hanson	Start Date:	11/21/2011
Stream Name:	Bloom Creek	Completion Date:	05/14/2012
Watershed:	James	Existing Structure:	Bridge
Structure Ownership:	County	New Structure:	Same – Scour Protection Only

Stream Habitat

Description of stream habitat: Intermittent prairie stream habitat.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.24
Structure Length (ft):	34.00
Permanent Impacted Length (ft):	80.00
Structure Width (ft):	80.00
Length Previous Structure (ft):	34.00
Width of Previous Structure (ft):	80.00
Countersink Depth (inches):	Not applicable

Comments: Scour protection (riprap) placed on berm embankments under the bridge; and lining the entire width of stream channel under the bridge and extending out 23’ both upstream and downstream of the bridge.

Diversion Channel

Diversion channel type: A diversion was not used.
Temporary water barrier type:
Date installation:
Date removed:

Description of stream flow: Completely dry. 2012 was a drought year.

Comments: None.

Erosion and Sediment Control

BMPs implemented: Silt fence, vegetated buffer, mulching, riprap.

Comments: BMPs appear to have been effective and functional at the time of site visit.

Fish Removal

Topeka shiners present: Stream was dry. No seining was required.
Topeka shiner mortality: 0

Comments: None

Impacts to Other Endangered Species: None

Conservation Recommendations:

Appendix II. Individual stream crossing reporting forms for projects that were constructed in 2012 and also impacted the American burying beetle.

SDDOT Project Reporting Form

PCN:	012E	DOT Region:	Pierre
Project Number:	BRF 6143(01)	DOT Area:	Winner
Structure Number:	62-330-380	Project Biologist:	Ryan Huber
Latitude:	43.22666	Project Engineer:	Randy Brown
Longitude:	-99.59329	Primary Contractor:	A-G-E Corp.
County:	Tripp	Start Date:	07/02/2012
Stream Name:	Ponca Creek	Completion Date:	08/14/2012
Watershed:		Existing Structure:	Bridge
Structure Ownership:	County	New Structure:	Box Culvert, CMP

Stream Habitat

Description of stream habitat: Typical prairie stream habitat. Adjacent land use is pasture.

Impacts to Stream Habitat:

Disturbed Area (acres):	0.75
Structure Length (ft):	78.00
Permanent Impacted Length (ft):	129.00
Structure Width (ft):	24.50 (twin 12')
Length Previous Structure (ft):	20.00
Width of Previous Structure (ft):	32.00
Countersink Depth (inches):	12

Comments:

Diversion Channel

Diversion channel type:	An existing dry channel (oxbow) to the north of the stream crossing passes under the road. A 72"corrugated metal pipe was installed at this location to divert any water from Ponca Creek into the dry channel around the project area.
Temporary water barrier type:	Berm barriers used in box culvert installation
Date installation:	07/06/2012
Date removed:	08/01/2012

Description of stream flow: Dry during construction. 2012 was a drought year.

Comments: None.

Erosion and Sediment Control

BMPs implemented: High flow silt fence, straw mulching, erosion control blanket, riprap, permanent seeding.

Comments: BMPs appear to have been effective and functional.

Fish Removal

Topeka shiners present: Tripp County is not located within Topeka shiner range.
Topeka shiner mortality: Not applicable

Comments: None

Impacts to Other Endangered Species: Tripp County falls within the known range of the American burying beetle. Earth disturbing activities were kept to a minimum.

Conservation Recommendations:

Appendix III. Monitoring Plan for structures which 'may adversely affect' Topeka shiners

South Dakota Fish Passage Monitoring Protocol for Projects Regulated by the 2008 Programmatic Biological Opinion: Stream Crossing Projects Administered/Funded by the South Dakota Department of Transportation and the Federal Highway Administration

Office of Project Development-Environmental
South Dakota Department of Transportation
2012

Submitted to:

United States Fish and Wildlife Service
Mountain-Prairie Region 6
South Dakota Ecological Services Office
Pierre, SD

Background and Purpose:

Construction of bridges and culverts by South Dakota Department of Transportation (SDDOT) and the Federal Highway Administration (FHWA) have and will continue to affect the streams and rivers of South Dakota. In 2008, SDDOT, FHWA, and the US Fish and Wildlife Service (FWS) developed and implemented a Programmatic Biological Opinion (Opinion) that evaluates potential impacts of stream-crossing projects on all federally listed Threatened and Endangered species in South Dakota. The Opinion specifically addresses adverse impacts to the Topeka Shiner (*Notropis topeka)* and the American Burying Beetle (*Nicrophorus americanus),* identifying nondiscretionary 'Reasonable and Prudent Measures' (RPMs) and their implementing Terms and Conditions (TCs) that, if followed, ensure the Incidental Take Statement issued with the Opinion remains valid and that any take resulting from stream-crossing projects is exempt under section 7(o)(2) of the Endangered Species Act. The RPMs and TCs relative to the Topeka Shiner are intended to minimize take primarily by preventing decreases in Topeka Shiner population and their occupied range in South Dakota.

Monitoring and reporting is required in the Opinion to ensure the RPMs and TCs for the Topeka shiner are appropriate and effective, and the level of take exempt by the Opinion is not exceeded. Development of a monitoring program is required under RPM 4 of the Opinion. The purpose of this monitoring program is to verify that SDDOT structures, as designed, constructed, and maintained are not influencing stream geomorphology or prohibiting fish movement.

The monitoring, to include field work and observations, will be done by SDDOT Environmental staff scientists and biologists, consultants, or temporary employees. Consultants and temporary employees will be trained by qualified SDDOT Environmental staff to ensure consistency in the assessments.

Fish Passage and Stream Crossing Design:

During project scoping, the Project Identification Coordinators (PICs) in cooperation with the Environmental Staff will identify structures where fish passage is required based on the Opinion. These structures are located in the eastern part of South Dakota where Topeka Shiners occur. Anomalous structures may also be included if it is determined that the structures may affect Topeka shiners. Anomalous structures may include features such as rock check dams to aid in fish passage or fish ladders when unusual methodology is determined necessary for fish passage. The USFWS will be notified if there are structures outside the main scope of this protocol.

TCs within the Opinion require that stream crossings be designed in a manner that facilitates development of normal channel features within the crossing. The SDDOT hydraulic design procedures have been established to meet or exceed the TCs of the BO. These procedures and definitions are documented in the South Dakota Drainage Manual hyperlinked at: http://sddot.com/business/design/forms/drainage/Default.aspx. Chapter 10 and sections 10.3.4.6 titled "Fish Passage" and Appendix 10.A titled "Fish Passage Guidelines" include additional design parameters used for fish passage.

The hydraulic design procedures for fish passage reference FHWA's Aquatic Organism Passage Design Guidelines for Roadway Culverts, Hydraulic Engineering Circular No. 26 (HEC 26). SDDOT design procedures and the USACE 404 nationwide permit further

require culverts be sunk below the stream flow line to allow development of natural channel features within the culvert and to prevent outlet perching that may lead to restricted fish movement.

Specifically, the natural channel forming process is to be maintained by sizing stream crossings according to bankfull (Q_2) channel size, streambed slope, and channel complexity. The floor elevation of culverts is to be set below flow line of the stream as appropriate to facilitate the development of normal channel features within the culvert. At a minimum the culvert floor elevation will be set 1 foot below the stream flow line but not less than the adjustment profile line. Depth of counter sinking will be determined through design analysis tools and programs as discussed in the hydraulics design procedures. The culvert width will be at least 1.2 times the Q_2 channel width unless special circumstances dictate otherwise and shall be estimated using project survey data and peak flow estimation models or other models as appropriate. Finally, any installed diversion channels must be at grade with the stream bed with no fish passage obstructions.

The bankfull channel can generally be defined as the Q2 stream channel or the elevation at which stream flow spills into the floodplain, whichever is less. In most cases, culverts will be sized much greater than the bankfull channel based solely on hydraulic criteria. In some rare cases, culverts may constrict the bankfull channel, especially if the culvert is designed for a very low flood recurrence frequency or the culvert is being placed in a watershed with a very large drainage area (i.e., > 100 sq mi). In some special cases, an exemption to the minimum culvert width may be allowed if strong evidence is available to suggest that fish passage will not be adversely impacted due to the width of the culvert. The USFWS will be notified if there are structures outside the main scope of this protocol and these projects will be processed through individual formal consultation. While exemptions do not fall under the terms and conditions of the BO, these structures will be monitored under this monitoring plan.

Site Inspections:

Monitoring in the late summer or fall will take place to adequately assess channel and streambed conditions resulting from past seasonal flows. Low flows of late summer and fall provide the best opportunity to access the site, evaluate channel and streambed conditions, take photos, and assess how the structure is functioning with regards to fish passage during low flows. Monitoring will be completed after the first high flow season following project completion and in the third and fifth year after construction[1]. For example, a structure built in the summer of 2012 will be assessed in the fall of 2013, 2015 and finally 2017. In order to limit stream degradation and harm to fish during these assessments, stream disturbance will be limited to the greatest extent practicable.

The SDDOT will make a reasonable effort to perform surveys for each structure appended to the 2008 B.O. in accordance with this monitoring protocol however; the FWS recognizes there may be conditions and limitations that may preclude completion of surveys at each site. It is also noted that structures built between 2009 and 2011 have not been reviewed to date (pending an approved monitoring protocol). These structures will be given initial priority and the first assessment observations of these structures will be compared to the original design drawings and NBI photos (if available).

[1] Opinion, p.46 RPMs/TCs B-1, Monitoring will be conducted on an annual or biennial basis

The inspection and findings documentation will be recorded on the 'SDDOT Fish Passage Assessment' form (See Attachment A).

The 'SDDOT Fish Passage Assessment' form includes the following:

General Project Information: This information will include specific project information, year constructed, county, structure location, stream name, date of assessment, and name of person completing the assessment.

- **Structure Type**: The structure type and size will be documented.

- **Structure Shape Comment:** The structure shape will be recorded using descriptions defined in the data sheet. The intent of recording structure shapes is to document whether the stream transition to and from the structure maintains and promotes fish passage. Terms used to describe the applicable outlet configuration are as follows:

  Inlet Type

  Projecting: The barrel simply extends beyond the embankment. No additional support is used.

  Wing wall: A wing wall is a retaining wall placed adjacent to a culvert to retain fill and to a lesser extent direct water.

  Head wall: Used along with wing walls to retain the fill, resist scour and improve the hydraulic capacity of the culvert

  Apron: Aprons are usually made of concrete or riprap and installed to prevent or reduce scour. If an apron exists, a brief description will be provided in the observation section, including any low flow concentration structures.

  Other: Could be Energy dissipaters, Bridge, etc...

  Outlet Type

  At Stream Grade: No perched condition at the outlet exists

  Cascade over Riprap: Culvert flows onto either a rough riprap surface causing turbulence or a riprap / bedrock surface where flow depth decreases as it exits the culvert. If this condition exists, observation will be made to document whether or not this condition may prevent fish passage.

  Free fall into Pool: Culvert outlet is perched directly over a pool, requires migrating fish to jump into culvert from outlet pool. If this condition exists, observation will be made to document whether or not this condition may prevent fish passage.

Free fall onto riprap: Culvert outlet is perched and exiting water plunges onto riprap or bedrock with no pool. If this condition exists, observation will be made to document whether or not this condition may prevent fish passage.

Outlet apron: Aprons are usually made of concrete or riprap and installed to prevent or reduce scour. If an apron exists, provide a brief description in the observation section, including any low flow concentration structures.

- **Observations:**
    1. *The structure is installed generally in accordance with plans (width, depth, location, size, countersunk, etc…).* This question will be answered during the first assessment only.
    2. *Overall structure width is wider than the average stream width upstream and downstream.* This measurement will be compared to background information from the hydraulic data and cross sections developed and used during design. If the background information does not exist, the stream width will be determined during the 1st assessment by taking an average of 3 measurements upstream and 3 measurements downstream.
    3. *Natural streambed material exists throughout structure (i.e. structure remains counter sunk approximately 1 foot).*
    4. *Stream channel is free of scour activity that may impede fish passage.*
    5. *A natural low flow channel exists through the structure or <u>if not</u> the streambed surface within the structure simulate the streambed beyond the structure inlet and outlet similar to design conditions.*
    6. *Steam is free of channelizing along the surface of the structure.* Presence of a Thalweg allows the stream to flow in a narrower defined low flow channel within the stream which is suitable for fish passage and not along the surface of the structure. If a Thalweg is not present, a wider shallower stream may impede fish movement due to limited depths, elevated water temperatures, and/or other conditions that are not ideal for fish passage.
    7. *Up & downstream channel appears stable (no apparent erosion).*
    8. *Vegetation is/has re-established on the stream banks within the construction area.*

- **Stream Cross-Sections:** To evaluate whether the SDDOT structures are performing as intended, stream cross-sections will be taken perpendicular to the stream at the following locations:

  3 cross sections will be taken at the following locations to determine if a Thalweg exists within the structure (see Figure 1): 1) within 10 feet of the structure inlet, 2) within 10 feet of the structure outlet, and 3) inside the structure (if accessible). Visual observations will be used instead of the 3rd cross section if this location is not be accessible (i.e. structure is too small to access with survey equipment, soil conditions are not stable, water volumes are excessive).

  If a Thalweg does not exist within the structure (the area is flat or there is only a slight depression with no true defined low flow channel), a 4th cross section will be taken downstream of the structure at a distance of approximately 7 times the width of the stream (refer to Figure 2) to determine whether the structure appears to be changing the stream profile.

If a Thalweg does not exist within the structure or downstream of the structure, a 5th cross section will be taken upstream of the structure at approximately 7 times the width of the stream (refer to Figure 3) to determine whether the structure appears to be changing the stream profile.

Analysis of cross sections taken will be used as follows and findings will be documented in the report as shown below:

1. If a Thalweg exists within the structure (cross sections 1, 2, and 3), no additional cross-sections will be taken and the assessment will document the structure is performing as intended. Else…
2. If a Thalweg does not exist within the structure (cross sections 1, 2, and 3) and does not exist downstream (cross section 4), no additional cross-sections will be taken. The assessment will document "no further conclusion can be made at this time as fish restriction (if occurring) is below the structure". Else…
3. If a Thalweg does not exist upstream, exists downstream but does not exist within the structure the report will document "the structure is no more of a barrier than the stream upstream and no further conclusion can be made at this time".
4. If a Thalweg exists upstream and downstream of the structure but does not exist within the structure a detailed survey and correction plan will be required.

- **Stream Velocity:** A natural earthen and/or granular stream bank edge is a good indicator the stream is acting independent of the structure. If the edge of the stream is in contact with the structure during Q_2 or lower conditions, material within the structure may have shifted or water velocities, turbulence, and friction along the structure walls may have an effect on fish movement.

  If the stream is in contact with one or both sides of the structure during the time of the assessment, the stream bed depth and reveal along the edges shall be evaluated to determine how the velocities compares to the natural stream edge outside the structure. The depth average velocity measured at a depth of 0.6 times the depth of the stream at the thalweg (see Figure 5) will be recorded and compared to the depth average velocity a distance approximately 7 times the width of the stream upstream and downstream of the structure within the Thalweg (see Figures 4) if a Thalweg exists.

  Analysis of stream velocities taken will be used as follows and documented in the report findings.

  1. If the stream is dry or water velocities are beyond the equipment's specified accuracy limits (i.e. <0.5 ft/s for March McBirney) at the locations where velocities are to be taken, the condition will be noted and no velocities will be taken. Else…
  2. If the depth average velocities within the structure are at or below those recorded upstream and downstream, the assessment will document the structure is not considered to be impeding fish passage. Else…
  3. If the depth average velocities within the structure are higher than those recorded upstream and downstream the structure and exceed the sustained swimming capabilities of Topeka shiner (0.9 ft./s -1.31ft./s. with burst swimming observed in

water velocities of 1.31ft./s-2.46 ft./s (Adams 2000)[2]), the structure may be influencing the stream. A more detailed survey may be required. Further assessment and the need for a correction plan will be discussed with the FWS.

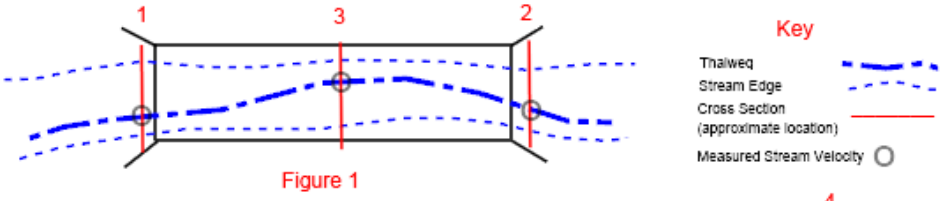

Figure 1

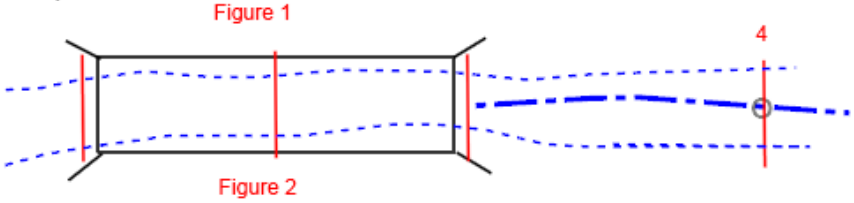

Figure 2

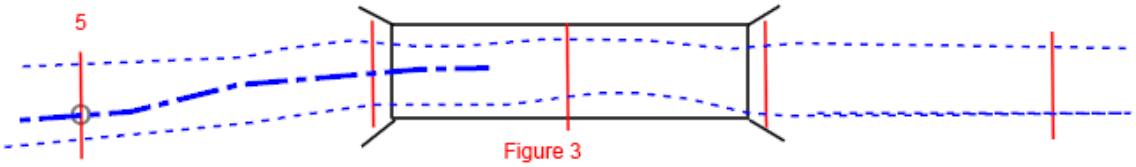

Figure 3

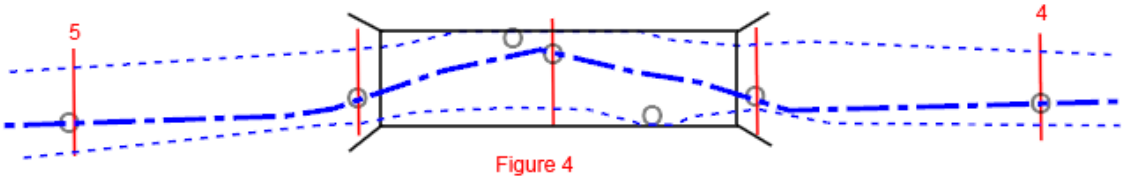

Figure 4

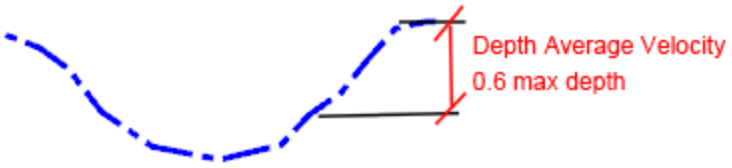

Figure 5

- **Comments**: Unique observations that have or may impact stream morphology or fish passage in the future such as widening of the channel, forming/changing pool locations/sizes, bank erosion, new deposits, isolated unusual channelization within the streambed, etc... will be noted. Changes to channel widths on structures designed narrower than the stream channel that were processed by Formal Consultation will be discussed.

- **Photographs:** A minimum of 2 photographs will be taken in the direction of the structure inlet and 2 in the direction of the structure outlet within a distance of 7 times the width of the structure. Photograph locations will be documented and recorded

[2] S. Reid Adams, Jan Jeffrey Hoover and K. Jack Kilgore 2000. Swimming Performance of the Topeka Shiner (Notropis topeka) an Endangered Midwestern Minnow. *American Midland Naturalist* Vol. 144, No. 1 pp. 178-186 Published by the University of Notre Dame

(i.e. GPS latitude and longitude coordinates) such that photographs taken during subsequent inspections will be from the same location and direction. The intent of these photographs is to document whether 1) the stream channel width, location, and/or depth is changing over time and 2) whether changes in the channel may obstruct fish passage at the site. It is most important to select locations that capture the intended need for the photograph therefore locations shall be selected both upstream and downstream that are representative of: undisturbed channel beyond the construction area, disturbed channel, and the structure.

Assessment, Notifications, Corrective Actions:

Upon completion of the site inspection and assessment, each report will be filed with the project records and in an electronic Fish Passage file folder.

If it is determined a structure is not passable to fish, a report will be submitted to the FWS and FHWA within two weeks and a corrective action plan will be developed in coordination with FWS and FHWA. Where fish passage has been obstructed by debris or some other condition not related to the design or construction, the SDDOT Environmental Staff will coordinate with Operations to have the obstruction removed within three months of the inspection. Depending upon seasonal conditions, this timeframe may need to be extended. If necessary, extensions will be coordinated with FWS. Obstructions identified and corrected by the Area Offices, through normal roadway maintenance inspections, will be reported to the Environmental Office for further review and corrective actions if needed. Documentation of corrective actions will be made available to FWS within two weeks of completion. Any corrective actions taken will be documented in the annual report and a corrective action database will be maintained by the Environmental Office.

Annual Reporting:

Per RPM#6 in the Opinion, a hard copy of the annual report will be provided to the FWS by March 1 of each year that reviews activities conducted under the Opinion. In an effort to disseminate monitoring findings in a timely manner, monitoring reports will be completed, included, and disseminated with the Annual Report. These reports will also be available by request as well as online to the FWS, FHWA and any other interested entities at the SDDOT website:
http://www.sddot.com/transportation/highways/environmental/endangered/Default.aspx

Within 1 month of distribution of the annual report (or other agreed time agreed to by all parties), the FWS, FHWA and SDDOT will meet to review report findings. If no corrective actions have been required within the first 5 years of monitoring, the need for further monitoring by site will be determined at this meeting. If systemic issues are identified, a corrective action plan will be developed and the group will determine whether any specific sites will be monitored beyond 5 years. During the annual meeting the group will also evaluate effectiveness of the data being collected on the 'SDDOT Fish Passage Assessment Work Sheet'. Revisions will be discussed and implemented as needed to meet the terms and conditions of the BO.

Appendix IV.

2012 Monitoring Reports for structures with determination of 'May Affect, is Likely to Adversely Affect' Topeka shiners